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Case Report

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Delayed presentation of hamate fractures: recognizing and addressing the hidden risks

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ABSTRACT

Hamatum fractures are rare fractures among carpal bone fractures. It can easily be overlooked in the emergency room and daily outpatient clinic examination. It has been 8 days since our patient was a right hand dominant male patient. The joint range of motion was full at the 6th week after surgery. A delayed or missed patient's results can lead to disability and poor outcomes. We emphasize to clinicians that rare bone injuries may be encountered, especially wrist injuries, and that wrist injuries should be examined in detail, and we hope that this article will raise awareness.

Keywords: Hamate fracture, carpal injury, delayed

INTRODUCTION

Isolated carpal bone fractures are uncommon, with hamatum fractures comprising 2-4% of these cases. Such fractures are infrequently documented in medical literature. Due to their unfamiliarity, they are often missed during initial examinations.[1] Undetected bone injuries of this type can result in non-union, progressive osteoarthritis, and chronic pain.[2]

The injury mechanism typically involves striking a hard object with a clenched fist, though it can also result from indirect trauma. These injuries are often overlooked in diagnosis because of unfamiliarity with the condition and the lack of clear physical and radiological signs.[3]

There is no definitive agreement on the best approach to managing acute CMC fracture-dislocations, as both conservative and surgical treatments have been shown to yield positive outcomes.[4] Nevertheless, most experts concur that delayed cases should be addressed with open reduction and internal fixation (ORIF) to restore anatomical structure, prevent secondary dislocation, and ensure full functional grip.[4,5]

We present the case of hamate fracture, which was treated with screw fixation of the hamate and KW fixation of the metacarpals.

CASE

We present the case of a 36-year-old male patient who visited our emergency department with extensive swelling and bruising on the right dorsal side of his hand, experiencing pain with movement and painful wrist movements.

The patient had initially visited the emergency department eight days prior with complaints of a heavy object falling on his hand at work. He was told there was no fracture and was given medication and referred to the orthopedic clinic. During the clinical examination, swelling, bruising, and movement restriction were noted on the right dorsal hand, with severe pain upon palpation of the proximal 4.5 metacarpal. The X-ray taken in the emergency department was reviewed, revealing that the initial X-ray was not taken in the appropriate position. A new AP-Lateral wrist X-ray was requested. The new radiograph revealed a fracture in the hamate bone (Figure 1). Given the intra-articular nature of the fracture, a wrist CT was performed for a more objective evaluation of the pathology (Figure 2). The CT scan revealed a type 2A hamate body fracture according to the Milch classification, along with associated 4-5 metacarpal dislocation. After consulting with the patient, a decision was made to proceed with surgery. The next day, open reduction was performed by the author, with fixation of the hamate body using two internal screws. Percutaneous K-wires were used to stabilize the 4th and 5th metacarpals.

Perioperative and postoperative X-rays showed satisfactory reduction and alignment (Figure 3). The patient had no issues during postoperative examinations, and neurovascular evaluation was normal. He was discharged the next day after a dressing change. At the one-week follow-up, the wound was clean and healing satisfactorily, and sutures were removed at the two-week follow-up.

At the four-week follow-up, repeated X-rays showed stable fixation and alignment of the carpal arch, leading to the

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removal of the K-wires from the 4th and 5th metacarpals. No pain or tenderness was detected during the examination. The patient, who was given hand rehabilitation, returned for a check-up two weeks later without any pain. Finger joint range of motion was complete, and there was no significant difference in wrist range of motion compared to the left wrist (Figure 4, 5).

Figure 1. Preoperative image demonstrating a displaced fracture of the Hamate (white arrow)

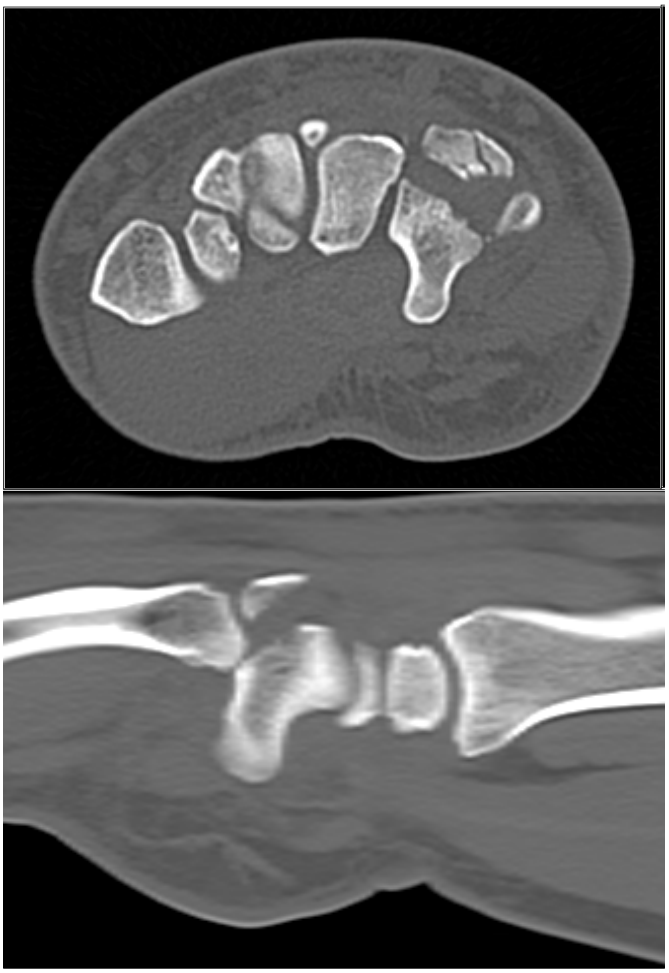

Figure 2. Preoperative CT scan illustrating a displaced fracture of the Hamate bone

Figure 3. Postoperative X-ray at 4 weeks

Figure 4. Postoperative X-ray at 6 weeks

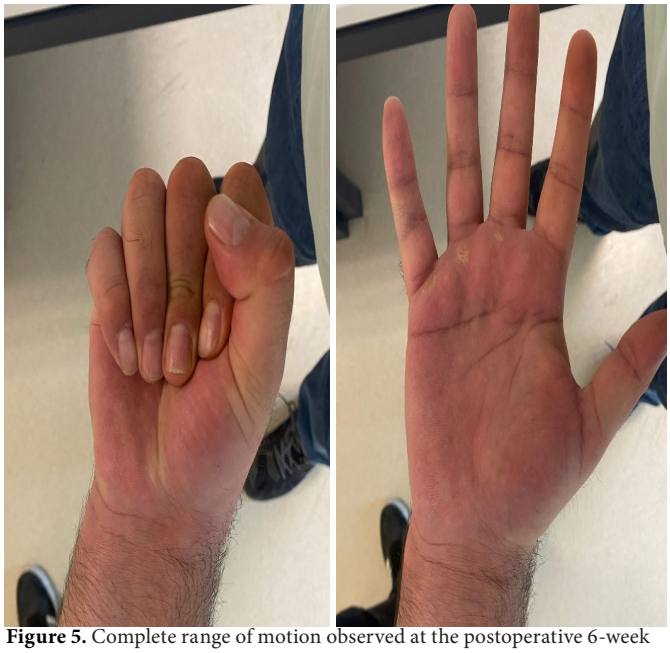

Figure 5. Complete range of motion observed at the postoperative 6-week

DISCUSSION

The hamate bone is located on the ulnar side of the distal carpal row. According to the Milch classification, its fractures are categorized into 2 main groups: hook (type 1) and body (type 2).[6] Type 1 fractures are commonly observed, with the hook forming the medial border of the carpal tunnel and the lateral aspect of the Guyon canal, starting from the palmar side. The hook serves as a pulley for the 4th and 5th flexor tendons.[7]

In cases like ours, hamate body fractures typically occur when a solid object impacts the hand in a clenched fist position, transmitting force through the 4th and 5th metacarpals to the hamate body, resulting in fracture. Another mechanism of injury involves mispositioning of equipment handles in sports like tennis, baseball, and golf, causing the force to pass through the hamate hook via the carpal arch and strain the 4th and 5th flexor tendons, leading to fracture.[8]

Delayed diagnosis of hamate bone fractures can result in nonunion, malunion, progressive osteoarthritis, and chronic pain. It may compress surrounding anatomical structures, leading to symptoms of compression in the ulnar and median nerves.[9] Avascular necrosis is rare in hamate fractures due to the triple vascular support.[10,11]

By reporting our experiences, we hope to increase awareness of hamate fractures, including their occurrence and potential mechanisms of injury. To facilitate timely diagnosis and appropriate treatment, we encourage other clinicians to report encounters with these unusual bone injuries when they occur.

CONCLUSION

Hamate fractures, often occurring concomitantly with carpometacarpal dislocations, are fractures that can easily be overlooked during initial evaluation in the emergency department. The consequences of a delayed or missed diagnosis can lead to disability and poor outcomes. Therefore, we emphasize the need for thorough examination, especially of wrist injuries, to prevent overlooking rare bone injuries. We hope that our article will increase awareness of these injuries among clinicians.

ETHICAL DECLARATIONS

Informed Consent

The patient signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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